

WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY
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JUNE 2006 REPORT

Note to Readers: Pages 1-12 comprise the summary and analysis of this report. Expanded details for some items that might not be available via the Internet at a later date are in the Appendix beginning on page 13.

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Item 1. New UN Peacebuilding Commission to Improve Post-Conflict Planning

The UN Peacebuilding Commission for post-conflict situations held its inaugural meeting on June 23, 2006. The new UN peacebuilding body was created to help prevent countries from falling back into violence, by adopting reconstruction, institution building, and other stabilization and development strategies specific to each country/region emerging from conflict. Since environmental issues are recognized as often being a contributing cause in conflict re-emergence, environment is expected to occupy an important position in the strategies set forward by the Commission. Proposed in 2004 by the Secretary General's High-Level Panel on Threats Challenges and Change, detailed by the *In Larger Freedom* report, the Commission was endorsed by the 2005 World Summit, and became operational in December 2005. The Commission is an intergovernmental advisory body requiring members to act only by consensus. The Peacebuilding Commission's membership includes seven members of the Security Council (including its five permanent members); seven States from the Economic and Social Council; five top contributors to the UN budget; five top providers of military personnel and civilian police to UN missions; and seven additional members (that have experienced post-conflict recovery) elected by the General Assembly.

Military Implications:

If not already established, a system should be created that continually identifies and feeds environmental lessons learned by the military (and others like UNHCR) regarding post-conflict situations to the new Commission. Such a cumulative and collective intelligence on post-conflict situations would be an asset for future military planning in post conflict situation. Military personnel involved in environmental matters should liaise with the Commission's Organizational Committee that is setting up the new body's procedures and working methods, to help add the environmental dimension to any conflict avoidance and/or country reconstruction plan.

Source:

United Nations Peacebuilding Commission

<http://www.un.org/peace/peacebuilding/>

Item 2. China's Five-Year Plan Increases Attention to Environmental Protection

The third of six points of the Chinese 11th Five-Year Plan for Economic and Social Development (2006-2010) states: *Third, we will promote development by relying on resource conservation and environmental protection and focus on the fundamental change of the economic growth mode, transforming economic growth from being driven by large amount of resources consumption to being driven by the improvement of resources utilization efficiency.* A white paper issued by the Information Office of China's State Council entitled *Environmental Protection in China (1996-2005)* is a comprehensive overview of China's enhanced attention to environmental protection, outlining efforts and achievements at the internal level, as well as its international cooperation in environmental matters, and future trends and policies. The paper stresses the need for more stringent regulations, policies, and enforcement. China's monitoring and management capabilities are to be improved by an advanced environmental early-warning system, and a sound environmental law enforcement and supervision system. The paper also

includes addressing nuclear and biological safety issues. This is China's second white paper on environmental protection since 1996.

Military Implications:

Military liaisons with China should explore how to assist the Chinese military's need to contribute to the third point of the Five-Year Plan. The *Environmental Protection in China (1996-2005)* white paper should be reviewed for insight into China's trends for new regulations concerning the environment internally, as well as for international negotiations. The paper might provide significant input to military personnel involved in studying new strategies regarding international environmental protection trends, as well as those involved in cooperation with China.

Source:

The 11th Five-Year Plan: Targets, Paths and Policy Orientation

http://english.gov.cn/2006-03/23/content_234832.htm

China issues white paper on environmental protection

http://news.xinhuanet.com/english/2006-06/05/content_4646390.htm (link might work randomly; see text of the paper's overview in the [Appendix](#))

Item 3. Korean Environmental Groups Request Release of U.S. Base Data

Green Korea and the Chuncheon Civic Group filed a lawsuit against the South Korean Ministry of Environment demanding full release of environmental data and the state of former U.S. military sites that are being returned to South Korea. The request is motivated by preliminary research findings by the Ministry of Environment leaked to Seoul's Hankyoreh newspaper earlier this year. Both U.S. Forces Korea and the South Korean government refuse to comment, invoking the SOFA between the two countries. Some data, debated in the national assembly, reveals troubling high pollution of the sites by lead, BTEX (benzene, toluene, ethyl benzene and xylene aromatic solvents), petroleum hydrocarbons, and several chemicals. South Korean officials refuse to take over the sites and rejected a compromise offer, USFK commander Gen. B.B. Bell told *Stars and Stripes*.

Military Implications:

This is an opportunity to deploy military leaders with successful environmental cleanup experience to resolve the situation, setting new precedents, if necessary, and improving bilateral and public relations.

Source:

Korean environmental groups sue for U.S. base data

<http://www.estripes.com/article.asp?section=104&article=38169> (article not always available; full text in the [Appendix](#))

Item 4. Stricter Measures to Protect Polar Regions Expected

The International Polar Year 2007 is expected to intensify research and discussions concerning climate change and its relation and effects to the Polar Regions. The Edinburgh Declaration was

adopted this month by the participants in the Antarctic Treaty Consultative Meeting. It pledges full political and financial support for scientific projects and assessment of existing and/or possible new regulations to protect the Polar Regions. Some 300 scientists and legal and political advisors from 45 countries Party to the Antarctic Treaty participated in the Treaty's Consultative Meeting in Edinburgh. They also agreed that the Treaty's next meeting in April 2007 in India would develop a code of conduct or minimum standards for those traveling to the Antarctic. Thousands of scientists from 60 countries will be conducting research during International Polar Year 2007-2008. They will have access to satellite data that cover the complete areas of the Polar Regions for the first time.

Military Implications:

The military should explore channels to participate in the development of the new codes of conduct, observe new developments in order to be prepared to comply with eventual new regulations, share data as appropriate for regional research, and increase awareness of how to reduce the impact of its activities on the fragile ecosystem.

Sources:

Antarctic Treaty meeting issues historic Edinburgh Declaration (20/06/06)

<http://www.atcm2006.gov.uk/servlet/Front?pagename=OpenMarket/Xcelerate/ShowPage&c=Page&cid=1150455183661>

Antarctic Treaty Nations Back Climate Science for 2007 Polar Year

<http://www.ens-newswire.com/ens/jun2006/2006-06-26-06.asp>

'Warm' species invading Antarctic

<http://news.bbc.co.uk/1/hi/5101790.stm?ls>

Earth Observation satellites contribute to International Polar Year 2007-2008

http://www.esa.int/esaEO/SEMABMVT0PE_planet_0.html

Item 5. Technological Breakthroughs with Environmental Security Implications**5.1 Models for Photochemical Pollution Assessment in Urban Areas**

A new multimedia mass balance model might improve knowledge and therefore actions concerning volatile organic compounds (VOC) that may impact the ozone in urban environments. The model can estimate VOC's emission source, level and fate, thus helping to focus resources and regulation efforts on VOCs of major concern. The authors underline though that the model's outcome should be complemented by better quantification of certain parameters. This work was funded by the American Chemistry Council, and the study was published in *Atmospheric Environment* (subscription required).

Military Implications:

Since VOCs are of major concern, it is possible that this model will supplement knowledge and provide additional scientific evidence for introducing new regulations to limit harmful emissions. Relevant military should review the model for possible applications to military emissions and to chemical weapon discovery or incident management.

Sources:

Improved assessment of photochemical pollution in urban areas

<http://ec.europa.eu/environment/integration/newsalert/pdf/25na5.pdf>

Canadian Environmental Modelling Network, Spring 2006 Newsletter

<http://www.trentu.ca/cemn/NewsReports/CEMNnews200604.pdf>

5.2 Polymer Nanofibers Provide Chemical Warfare Defense

Researchers at the Nanobioengineering Labs of the National University of Singapore's Faculty of Engineering have developed a polymer nanofiber membrane on which chemical warfare agents, like nerve gases, are physically adsorbed and then catalytically decomposed. Previous protective materials have only adsorbed the toxin, so their disposal presented a problem; here the chemical is actually destroyed.

Military Implications:

The military should investigate this new technique for its application to protective measures for personnel in cleanup of post-CW environments.

Source:

Novel Use of Polymer Nanofibers as Filters for Chemical Warfare Defense

<http://www.newswiretoday.com/news/6042/>

5.3 Two New Nanotech-based Power Source Improvements

Nanotechnology has pointed the way to two new improvements in portable power sources, suitable for environment-sensing devices. In the first, a team under Prof. Joel Schindall of the Laboratory for Electromagnetic and Electronic Systems at MIT has developed a capacitor whose electrodes are covered with a forest of millions of nanotubes, enormously increasing their effective surface area, the governing factor for the amount of charge a capacitor can hold. Such a device can compete with a conventional battery in terms of the total amount of power it can deliver over a period of time, and, since it does not involve a chemical reaction, has the added advantages that it is almost instantly chargeable and would not wear out with hundreds of thousands of recharging cycles, avoiding the used battery disposal problem.

The other new technology comes from France, where Prof. Patrice Simon of the Université Paul Sabatier, who was aided also by colleagues at the Université Picardie Jules Verne, describes the development of lithium-ion battery electrodes that have several times the energy capacity by weight and volume of existing electrodes. As in the scheme above, the electrodes are covered with a forest of nanotubes. This 3D configuration provides 50 sq cm of active area for each sq cm of base area.

Military Implications:

The military should follow both these lines of development for their possible application to new and more efficient power sources, including portable environmental sensing devices, and more environment-friendly batteries.

Sources:

Super Battery

http://www.sciencentral.com/articles/view.php3?article_id=218392803&cat=3_all

Higher-Capacity Lithium Ion Batteries

http://www.technologyreview.com/read_article.aspx?id=17017&ch=nanotech

Item 6. Study Finds TiO₂ Nanoparticles as Possibly Brain-damaging

Preliminary results in a new study from EPA's National Health and Environmental Effects Research Laboratory indicate that titanium dioxide nanoparticles may cause a reaction that could seriously damage brain cells. The particles trigger the release from some cells of biologically active molecules, known as reactive oxygen species (ROS), which can damage surrounding cells.

Military Implications

Although these are preliminary results based on an in vitro mouse model, the military should begin its own preventive health research and start considering possible replacements for any TiO₂-nanoparticle-containing products it uses, in view of the potential of future regulations banning that constituent.

Source:

Study links TiO₂ nanoparticles with potential for brain-cell damage

http://pubs.acs.org/subscribe/journals/esthag-w/2006/jun/tech/lt_nanoparticles.html

Item 7. Updates on Previously Identified Issues

7.1 International Controversies over REACH

Thirteen of the EU's top trading partners, including the United States, Australia and Japan, urged the EU to reconsider some of the harsh terms of its REACH (Registration, Evaluation and Authorisation of Chemicals) bill, since they are hard to implement and thus might hurt trade. REACH would require that the properties of about 30,000 chemicals produced or imported in the EU be registered with a central agency, while those of highest concern, like carcinogens, would require further testing and authorization. REACH is expected to get a second reading in the European Parliament later this year. [See also *Integration of Chemical Regulations (REACH) Approved by European Council* in December 2005, *The REACH Program Closer to Entry into Force in March 2005*, and other related items in previous environmental security reports.]

Military Implications:

[Similar to previous on the same issue] Assessment of the REACH system's latest proposed changes and their impacts on military operations in Europe in relation to existing SOFAs and other agreements remains important. As currently proposed, the REACH system still implies the registration of all compounds in volumes over 1 metric ton per year in use within the EU.

Sources:

US, Others Press EU to Re-Think Chemicals Bill

<http://www.planetark.org/dailynewsstory.cfm/newsid/36730/story.htm>

REACH <http://europa.eu.int/comm/environment/chemicals/reach.htm>

7.2 Global Warming Linked to Hurricanes in 2005

A new study by the National Center for Atmospheric Research demonstrates that global warming played an important role in 2005's record 28 tropical storms and hurricanes in the Atlantic. The study also predicts that, although not necessarily setting another record, 2006 might also

experience a ‘very active’ season, with 13-16 named storms, 8-10 hurricanes, and 4-6 major hurricanes. The researchers warn that in the long-term, ocean warming will raise the baseline of hurricane activity.

New scientific evidence that the increased number and intensity of extreme weather events is linked to climate change were presented at the 40th annual Canadian Meteorological and Oceanographic Society (CMOS) congress in Toronto. Over 800 scientists discussed evidence and debated strategies to cope with climate change effects. There is unanimous agreement that reducing greenhouse gas emissions should be high on political and industrial business agendas.

Military Implications:

[Similar to previous on the same issue] There is compelling evidence of the occurrence of anthropogenic climate change added to natural changes, and the growing world option for action. The military should continue to accelerate their efforts to reduce its greenhouse gas emissions. New international environmental security-related policies and cooperation to avoid potentially large-scale disasters and conflicts seem inevitable.

Sources:

New Data Clearly Links Storms and Warming
<http://www.ipsnews.net/news.asp?idnews=33533>

Global Warming Kicked 2005 Hurricanes Up A Notch
<http://www.ens-newswire.com/ens/jun2006/2006-06-26-01.asp>

7.3 Dossier about Drylands and Desertification Launched by Scidev.Net

With the occasion of this year’s World Environment Day, June 5, which had the theme *Deserts and Desertification*, SciDev.Net launched an online dossier resource addressing science and policy issues relating to drylands and desertification. The dossier will be continuously updated with news, features and opinion articles addressing different models, uncertainties, and possible implications of drylands and desertification phenomena, including policy briefs and case studies, and progress reports on the UN Desertification Convention. It is a valuable service for those wishing to keep abreast of dryland issues. SciDev.Net's desert science dossier has been produced with the support of the Consultative Group on International Agricultural Research (CGIAR). About 2 billion people live in the world’s drylands and 250 million people already left their homes because of unproductive soils. [See also *International Year of Deserts and Desertification—2006* in January 2006, and *Desertification Synthesis (MA report 3)* in June 2005 environmental security monthly reports.]

Military Implications:

Those developing military programs to prevent environmentally induced conflicts might consider adding this online resource as a data source for designing new policies and strategies to counter desertification and help cope with its consequences.

Source:

SciDev.Net's desert science dossier <http://www.scidev.net/desertscience>

7.4 Small Low-lying Island States in Jeopardy

If ocean waters keep rising, low-lying states might disappear, making entire nations (such as the 12,000 people of Tuvalu) become environmental refugees forced to resettle elsewhere. Small island states like Tuvalu may take legal action against high greenhouse gas emitters like the U.S. The situation of these island nations topped the agenda of the tri-annual gathering of the Pacific Leaders Meeting (PALM) held in Okinawa, Japan, in late May. Acknowledging the critical situation of the small island countries, the leaders of 14 Pacific island nations and Japan, adopted the Okinawa Partnership Declaration, which considers a new approach to the dispatch of aid assistance. [See also *Future Sea-level Rise will make Freshwater Brackish* in March 2006, *Several Small Asia/Pacific Countries at Risk because of Rising Sea Levels* in January 2006 and other related items in previous environmental scanning reports.]

Military Implications:

There is no clear framework to deal with the potential of large numbers of future environmental refugees. The issue is not simply one of accommodating individual migrants. It will entail relocating entire sovereign nations, having the right to their own laws and culture, into other nations' systems. It might prove difficult, not excluding the potential for eventual conflict. The military should consider working together with its counterparts in the countries that might become host states for large environmental refugee populations to develop a plan to accommodate them.

Sources:

INTERVIEW - Situation in Sinking Tuvalu Scary, Says PM

<http://www.planetark.com/dailynewsstory.cfm/newsid/36546/story.htm>

Japan courts Pacific island states in summit

<http://today.reuters.com/News/CrisesArticle.aspx?storyId=T79196>

Japan lavishes aid on Pacific Islands

<http://www.taipetimes.com/News/world/archives/2006/05/28/2003310408> (link works randomly; full text in the [Appendix](#))

Japan increases aid to Pacific Is.

http://www.matangitonga.to/article/spnews/pacificislands/palm_japan2_290506.shtml

7.5 Trans-boundary Pollution Regulations Need Better Enforcement

A joint lawsuit by Canada and the U.S. against U.S. coal-burning power plants brought back on the agenda the danger that air pollution generated in any one part of the world poses to other countries and regions. Although regulations exist, their effectiveness is hindered by insufficient adherence or lack of successful enforcement. Better detection and tracking of pollution, global information sharing, and an increasingly informed and active civil society, might change this situation. "Review of compliance by the Parties with their obligations under the Protocols to the Convention" is one of this year's work plan objectives of the Air Pollution Convention. [See also *Study Proposes an International Air Pollution Treaty and Protocol to Control Heavy Metals to Enter into Force* in October 2003 and *EU Parliamentary Committee Moves to Strengthen Air Pollution Laws* in January 2004 environmental security reports.]

Military Implications:

New negotiations for enforcing the Air Pollution Convention and related regulations are likely. The military should consider increasing vigilance for possible pollution caused by its activities and eventually be prepared to comply with new international air pollution regulations which might get incorporated into existing domestic ones. New treaty principles might impact military equipment engineering requirements to ensure compliance with the international air pollution standards.

Source:

Air Pollution Goes Global

<http://www.ipsnews.net/news.asp?idnews=33482>

Convention on Long-range Transboundary Air Pollution

<http://www.unece.org/env/lrtap/>

ICJ Set to Hear Argentina-Uruguay Pulp Mills Case

<http://www.planetark.com/dailynewsstory.cfm/newsid/36715/story.htm>

7.6 Green Buildings in North America Project Started

The Commission for Environmental Cooperation (CEC) officially begins its study, *Green Building in North America: Opportunities and Challenges*, hoping to increase the role of environmental considerations in the design of buildings across the continent. A 20-member interdisciplinary and international advisory group will assess the current status and prospects for green building, and identify eventual obstacles as well as potentials—including environmental benefits. Green building is very weak in North America, although it is estimated that U.S. buildings consume 65% of all electricity generated, 40% of raw materials and generate about 30% of all greenhouse gas emissions. The advisory group will present a report and provide the CEC Secretariat with recommendations for the final report, expected in the fall of 2007. [See also *Two Global Alliances for “Greener” Buildings Around the World* in April 2006 environmental security reports]

Military Implications:

The military should suggest to its contractors that they follow the development of the study and eventually contact members of the advisory group to share and learn best design and construction practices for improved environment-friendly built environments. This is another opportunity to further the *Army Strategy on the Environment*.

Source:

Advisory group named to CEC study on green building

<http://www.cec.org/news/details/index.cfm?varlan=english&ID=2707>

7.7 Earth’s Biodiversity Decline Increasing

The recently released 2006 IUCN Red List of Threatened Species by The World Conservation Union reveals that Earth’s biodiversity continues to decline. According to the latest assessments, globally, the number of known threatened species has reached 16,119. New species on the list include the polar bear, ocean sharks, freshwater fish and Mediterranean flowers. [See also *International Biodiversity Meetings Make Decisions* in March 2006, *New Protected Ecological Sites* in July 2005, and other related items in previous environmental security reports.]

Military Implications:

The extension of the Red List, along with the other studies showing that biodiversity is in jeopardy, might increase the number of protected areas, as well as enforcement of related regulations, thus possibly impacting military planning.

Source:

2006 IUCN Red List website <http://www.redlist.org>

7.8 Addressing Nanotechnology Risks**7.8.1 New Regulations Suggested to Address Nanotech-related Hazards**

Citing gaps in regulating future uses of nanotechnology (including those relating to particle size, the use of nano versions of already approved ingredients, and packaging), the British Food Standards Agency suggests in its recently released regulatory review that legislation be speedily amended to require that all nanocomponents be subject to their own risk assessment. The Royal Society has also issued a statement, following up its 2004 report on nano hazards, saying that Industry should disclose how it tests products containing nanoparticles. Further, the Department for Environment, Food and Rural Affairs (Defra) is currently working on extending their regulatory framework to include nanomaterials.

Germany also is also beginning a risk survey on nanotechnology in food, cosmetics, and other commercial products. The survey will be conducted by ZIRN (Center of Interdisciplinary Risk-science and Sustainable Development of Technology) and will investigate current and future nanotechnology applications, as well as potential risks. Its results will be discussed in two subsequent workshops and then transformed into a "risk barometer" for the information of the public. They could also lead to new regulations.

Nano-Regulation: A multi-stakeholder-dialogue-approach towards a sustainable regulatory framework for nanotechnologies and nanosciences report has been issued by the Innovation Society Ltd., an independent consulting company, based at the Technology Centre of the Federal Institute of Materials Science & Technology (EMPA) in St. Gallen, Switzerland, as part of its Platform "Nano-Regulation" project, in cooperation with NanoEurope and NanoCluster Bodensee. The report presents the results of a Delphi process undertaken with 35 expert representatives of all stakeholder communities in nano regulation.

Nanoforum, an all-Europe nanotechnology network funded by the EU and its Institute for Environment and Sustainability, has released a report outlining the conclusions from its workshop, 'Nano and the Environment' held in Brussels in March 2006. The workshop brought together stakeholders from all sectors of the nanotech world to discuss key issues surrounding nanotechnology and the environment, including monitoring, pollution and remediation, and resource saving. The report covers detection of air and water pollutants; life-cycle analysis; applications for energy sustainability; risk assessment; nanotechnology applications for remediation of environmental toxins; commercialization; challenges of communication within the nanotech field, regulatory policy initiatives; public education; and societal and ethical implications.

Along the same lines, *Taking Action on Nanotech Environmental, Health, and Safety Risks*, report by Lux Research, concludes that nanotechnology environmental, health, and safety risks

have to be promptly addressed, urging the government to consider comprehensive and clear regulations.

Military Implications:

Military personnel concerned with assessing and addressing nanotechnology risks should follow these new developments in the national and international arenas, both for cooperation and preparedness for possible new regulations.

Sources:

UK food regulator finds 'gaps' in regulating nanotechnology

<http://foodproductiondaily.com/news/ng.asp?n=67935-nanotechnology-fsa-novel>

Germany Begins Risk Survey on Nanotechnology

<http://www.foodproductiondaily.com/news/printNewsBis.asp?id=68637>

Nano-Regulation Report

http://www.innovationsgesellschaft.ch/images/publikationen/Nano_Regulation_final3.pdf

Title: Nano and Environment Workshop Report

http://www.nanoforum.org/nf06~modul~showmore~folder~99999~scid~383~.html?action=longview_publication&

Lux Research Inc. email newsletter (full text in the [Appendix](#))

7.8.2 Nanotube Toxicity Results Vary with Test Context

Recent results have shown the need for great care in interpreting results on the toxicity of nanotubes and other nano materials. They show major differences between in vitro and in vivo tests, and among tests using different culture media. The reasons for these discrepancies are not clear.

Military Implications

Military organizations concerned with nanotech, preventive health and the environment should follow investigations into these variant results, and should ensure that risk assessments take these uncertainties into account.

Source:

Nano World: Nanotube Toxicity Exams Differ

<http://www.upi.com/Hi-Tech/view.php?StoryID=20060601-111345-7376r>

Item 8. Reports Suggested for Review

8.1 Implications of the Growing Biofuels Industry

Global ethanol production more than doubled between 2000 and 2005 and biodiesel expanded nearly fourfold versus oil production that increased by only 7% over this period, notes *Biofuels for Transportation: Global Potential and Implications for Sustainable Agriculture and Energy in the 21st Century* report by Worldwatch. Since the world's oil demand and prices are increasingly hindering energy security and development, there are strong growing incentives for the biofuels industry and increased trade. Furthermore, 25 of the world's 47 poorest countries import all of their oil, while having a substantial agricultural base to grow energy crops. While noting the advantages of biofuel industry, the report also warns of the problems such as replacing food

crops for energy crops, expansion of agricultural land, and water needs. International biofuel trade regulations and standards will be needed.

Military Implications:

In addition to some policy incentives for increasingly replacing fossil fuel by biofuel, the report is interesting for the ecological and regulations-related warnings that are usually neglected in a fast-growing industry run by high supply demand. Relevant military personnel should consider the report for its various inputs for improved military energy-environmental options.

Source:

Biofuels for Transportation: Global Potential and Implications for Sustainable Agriculture and Energy in the 21st Century

<http://www.worldwatch.org/node/4078>

8.2 Assessment and Recommendations for Biosecurity

The *Globalization, Biosecurity, and the Future of the Life Sciences* report by the Committee on Advances in Technology and the Prevention of Their Application to Next Generation Biowarfare Threats of the National Research Council, assesses the concerns related to developments in biomedical research under the circumstances of globalization. It reinforces the role of international scientific exchange; the need for national and international codes of ethics and conduct for researchers and scientists working in life sciences; and the need for improved health infrastructure to respond to emergencies such as bioterrorist attacks or pandemics. It also recommends better integrated work between the scientific and intelligence communities to anticipate and manage the potential misuse of biomedical research and the technologies it generates.

Military Implications:

In view of already growing international concern related to bioterrorism and pandemics, the report might provide concrete input and speed up international action for a global biosecurity network, as well as adequate regulations. Relevant military personnel should consider the report for its various inputs that might be useful in formulation of national bioterrorism policy and collaboration with the scientific community and counterparts around the world.

Source:

Globalization, Biosecurity, and the Future of the Life Sciences

<http://www.nap.edu/catalog/11567.html>

8.3 Deep Seas and Open Oceans Need Urgent Conservation Actions

Ecosystems and Biodiversity in Deep Waters and High Seas, a joint UNEP and World Conservation Union (IUCN) report, calls for urgent measures to conserve the world's entire marine environment—including areas beyond national jurisdictions. More than 90% of the planet's living biomass is found in oceans and seas, and is jeopardized by human activity, according to the report. Present institutions and conservation efforts are primarily focusing on coastal waters where, until recently, most human activity, like fishing and industrial exploration, took place. As these activities extend beyond those limits, so should the conservation measures. Given that over 60% of the marine world and its rich biodiversity are beyond the limits of national jurisdictions, international guidelines, rules and actions are needed to protect this ecosystem critical to the very existence of life on the planet.

Military Implications:

This report complements various international meetings and discussions concerning marine conservation and sustainable management of the deep seas and open oceans. It is likely that regulations that reflect an integrated approach to oceans management based on 'ecological boundaries' rather than just political ones and with higher levels of protection to marine ecosystems will emerge, with potential implications for training and other military operations.

Sources:

Action Urged to Avoid Deep Trouble in the Deep Seas

<http://www.unep.org/Documents/Multilingual/Default.asp?DocumentID=480&ArticleID=5300&l=en>

Ecosystems and Biodiversity in Deep Waters and High Seas

http://www.unep.org/pdf/IUCN_Report_16June06.pdf

8.4 European Adaptability to Climate Change is Questioned

A June 15, 2006 report for the Director General for the Environment of the European Commission explores the secondary and tertiary social impacts of climate change and finds that: 1) indirect effects may be more important than the direct effects of climate change (ripple effects of changes in agricultural cycles and changing demands); 2) impacts are likely to be uneven across sectors and communities; and 3) national preparations may not have sufficiently considered the difficulties of those in marginal areas or conditions.

Military Implications:

This report should be reviewed by those with long-term planning responsibilities for military operations in Europe.

Sources:

Adaptive Capacity to Climate Change May be Overestimated

<http://ec.europa.eu/environment/integration/newsalert/pdf/26na1.pdf>

APPENDIX

Reference Details

This Appendix contains expanded background information on some items, and the full text for the articles that are not available on the Internet or are usually stored for a limited time on the respective Web sites.

Item 2. China's Five-Year Plan Increases Attention to Environmental Protection

China issues white paper on environmental protection

http://news.xinhuanet.com/english/2006-06/05/content_4646390.htm (link might work randomly)

[Full text: Environmental Protection in China \(1996-2005\)](#)

BEIJING, June 5 (Xinhua) -- Environmental protection, now one of the "brakes" in China's economic macrocontrol policies, will play a more prominent role in the approval process for large construction projects, a Chinese official said on Monday.

Projects will be cancelled if they either overdevelop land resources or may affect surrounding eco-environment negatively, said Zhu Guangyao, deputy director of the State Environmental Protection Administration (SEPA), at a press conference releasing the country's second white paper on environmental protection since 1996.

Stricter assessment of construction projects, as Zhu illustrated, is just one of the government's measures to realize the environmental protection goals highlighted in the white paper.

The 45-page white paper, titled "Environmental Protection in China (1996-2005)" and released by the Information Office of the State Council, China's central government, says that the situation of environmental protection in the country is still "grave".

The paper points out that since the late 1970s, China's economy has developed rapidly and continuously. During the process, many environmental problems that haunted developed countries in different phases of their 100-year-long industrialization occurred in China all at the same time.

The conflict between environment and development is becoming ever more prominent. Relative shortage of resources, a fragile ecological environment and insufficient environmental capacity are becoming critical problems hindering China's development, it says.

The Chinese government has attached great importance to environmental protection and set it as a basic national policy and sustainable development as an important strategy.

Thanks to these efforts, although the amount of resource consumption and pollutants is

increasing greatly, the trend toward aggravated environmental pollution and ecological destruction is slowing down, says the white paper.

According to the white paper, since 1996, the State has formulated or revised major laws on environmental protection, such as those on prevention and control of water pollution, marine environment protection, prevention and control of air pollution, as well as evaluation of environmental impact.

For three years in a row, the state has launched special environmental protection campaigns to rectify enterprises that have discharged pollutants in violation of the law and to protect people's health, closing down 16,000 enterprises.

Statistics in the white paper show that the amount of industrial waste water, oxygen for industrial chemicals, industrial sulfur dioxide, industrial smoke and industrial dust discharged in generating one unit of GDP in China in 2004 dropped by 58 percent, 72 percent, 42 percent, 55 percent and 39 percent, respectively, from 1995.

Compared with 1996, in 2005 the proportion of cities with air quality reaching Grade II of the state standard increased by 31 percentage points, while that of cities with air quality lower than Grade III decreased by 39 percentage points.

In recent years, China has completed more than 800,000 rural drinking water projects, solving difficulties and insecurity in this regard for 67 million rural residents.

The white paper also says that the total newly afforested area has reached over 6.67 million hectares every year since 2002. At present, the national forest acreage is 175 million hectares, the forest cover 18.21 percent.

By the end of 2005, there were 2,349 nature reserves of various kinds and levels in China, covering 1.5 million square km and taking up about 15 percent of the country's land territory.

The last decade has seen the largest increase ever in China's investment in its environmental protection, says the paper.

Between 1996 and 2004, China's investment into environmental pollution control reached 952.27 billion yuan (119 billion U.S. dollars), amounting to one percent of that period's GDP. The year 2005 alone saw a total investment of 238.8 billion yuan (29.9 billion U.S. dollars), with its ratio in GDP up to 1.3 percent.

The white paper, however, also notes that the government is fully aware of the grave situation of environmental protection in the country.

Earlier statistics show that rivers that go through cities are polluted in sections of the downtown areas; one fifth of Chinese cities suffer from serious air pollution; one third of the land area is affected by acid rain; 3.56 million square kilometers of land suffer soil erosion; 1.74 million square kilometers of land experience desertification; more than 90 percent of natural

grasslands have degenerated and biodiversity has decreased.

Premier Wen Jiabao said in April at the sixth national environmental protection conference that environmental protection will become part of the assessment system of economic and social development and the performance of officials.

Zhu Guangyao showed a deep concern over local officials' emphasis on economic development.

"The 7.5 percent annual growth rate set by the 11th Five-Year Plan will keep the country's development at a stable pace. But some local governments, especially those in remote and backward areas, are still pursuing rapid economic development, giving more pressure on local environment and resources," he said.

He suggested more efforts should be devoted to maintaining a reasonable and ordered development level and to enhancing the awareness of the importance of environmental protection among local officials and the public.

In the 11th Five-Year Plan, China has clearly set forth its main goals for environmental protection for the next five years: by 2010, while the national economy will maintain a relatively stable and fast growth, the environmental quality of key regions and cities will be improved, and the trend toward ecological deterioration will be brought under control.

The blueprint for the country's development in the next five years also requires energy consumption per unit of GDP to decline by 20 percent, compared with the end of the 10th Five-Year Plan period.

The total amount of major pollutants discharged will be reduced by 10 percent, and forest coverage will be raised from 18.2 percent to 20 percent, according to the plan.

Zhu also listed seven tasks as the major environmental protection work to ensure the fulfillment of these goals. The most important task is water pollution control, with focus on drinking water security.

Other tasks including urban and rural environmental protection, air pollution control, eco-system protection, enhancement of nuclear and other radioactive sources security and implementation of the state environmental protection projects.

In China's future development, environmental protection will become a more and more important standard for the government to adjust its macrocontrol policies, which will ensure a balanced, healthy and sustainable economic growth, Zhu said.

Editor: Yang Lei

Item 3. Korean Environmental Groups Request Release of U.S. Base Data

Korean environmental groups sue for U.S. base data

Activists allege pollution at sites being returned to South Korea

By Erik Slavin, Stars and Stripes, Pacific edition, Sunday, June 25, 2006

<http://www.estripes.com/article.asp?section=104&article=38169>

Local report details problems with bases

Earlier this year, Seoul's Hankyoreh newspaper said it acquired leaked preliminary data from the Ministry of Environment's research on U.S. bases to be returned to South Korea. Neither U.S. Forces Korea nor the South Korean government would confirm or deny the findings, which included the following:

Lead levels at the Oklahoma, Kansas, Texas and North Carolina firing ranges in Area I ranged between 4,990 and 15,200 milligrams per kilogram of soil. If lead leeches into groundwater in high quantity, it can severely damage the brain and kidneys when ingested, according to the U.S. Centers for Disease Control. The U.S. Environmental Protection Agency caps safe drinking water lead levels at .015 milligrams of lead per liter/kilogram of water.

Levels of BTEX, a group of four chemicals that make up a large percentage of petroleum products, at Camp Page registered at 1,152 milligrams per kilogram of soil. South Korea's national standards call for "anti-contamination measures" at 200 milligrams per kilogram of soil. Benzene, one of the chemicals in BTEX, is listed by the EPA as a known carcinogen. The EPA's maximum permissible level for benzene in drinking water is 5 parts per billion, or .005 milligrams per liter/kilogram.

Total petroleum hydrocarbons, which can include several chemicals, also showed elevated levels. Levels at Camp Page registered 50,552 milligrams per kilogram of soil. Camps Howze, Greaves, Stanton and Garry Owen ranged between 20,767 and 47,819 milligrams per kilogram of soil. South Korea's national standards call for anti-contamination measures at 1,200 milligrams per kilogram of soil, according to Green Korea, which filed a lawsuit against the South Korean government for full release of its base environmental data.

— Erik Slavin

CAMP RED CLOUD, South Korea — Two groups have filed a lawsuit against the South Korean Ministry of Environment to gain the release of pollution data from U.S. military bases scheduled to be returned to South Korea.

Green Korea and the Chuncheon Civic Group claim in a lawsuit filed earlier this month that the October 2005 data, some of which was acquired by a Seoul newspaper and debated in the national assembly, is of overriding interest to the nation's citizens.

U.S. Forces Korea refused to release any environmental data to Stars and Stripes, stating that the status of forces agreement between the United States and South Korea prevents it.

Both the United States and South Korea must consent to the official release of data from the Environmental Subcommittee of the SOFA Joint Committee, USFK spokesman Dave Oten said.

“While some preliminary data has been gathered, information of public interest will only be released by the subcommittee upon mutual agreement of the ROK and USFK representatives using a joint statement,” Oten said. “No such statement is currently planned.”

A report from the Seoul-based Hankyoreh newspaper earlier this year said the leaked data showed unsafe levels of ground and water contamination at several military sites. They include Garry Owen, Greaves, the Kimpo post terminal, Stanton, Edwards, Giant, Page, Falling Water, the Freedom Bridge, Howze and the Oklahoma, Kansas, Texas and North Carolina firing ranges.

“It is not understandable that such information is not being disclosed to the Korea National Assembly, as well as Korea’s citizens,” said Green Korea spokeswoman Ko Ji-sun. She said that the cited SOFA provision is absurd and fosters suspicion among South Koreans.

The United States has tried to return closed bases for the past 18 months, but South Korea has declined.

Army officials boil the issue down to two main points: money and sticking to an agreement.

When the base handover agreements were completed by a previous South Korean government, that government agreed to take the land “as is,” including all buildings and infrastructure at no cost, military officials have said.

Further cleanup efforts beyond what the United States already has done should be handled by the South Korean government as “the price of peace,” some Army officials say.

Meanwhile, guarding the empty bases costs America \$400,000 each month, USFK officials say.

In an interview earlier this year, USFK commander Gen. B.B. Bell told Stripes that the U.S. sought to compromise, offering to remove all underground fuel tanks on all camps and underground water table remediation on five camps. South Korean officials rejected the offer, Bell said.

Meanwhile, South Korean environmental government officials have refused to comment on the leaked data and status of the bases in question.

“We cannot confirm any of things from the study, and I have nothing to say about the issue,” said Seung Su-ho, chief of the military base environment management division for the Ministry of Environment.

Hwang Hae-rym contributed to this report.

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Item 7. Updates on Previously Identified Issues

7.4 Small Low-laying Island States in Jeopardy

Japan lavishes aid on Pacific Islands

Published on TaipeiTimes

<http://www.taipetimes.com/News/world/archives/2006/05/28/2003310408> (works randomly)

DOLLAR DIPLOMACY: Tokyo's offer of US\$410 million in fresh aid could persuade Pacific leaders to back its bid for a seat on the UN Security Council, analysts said

AP , NAGO, JAPAN

Sunday, May 28, 2006, Page 5

Japan lavished \$45 billion (US\$410 million) in fresh aid to Pacific Island nations at a leaders' summit yesterday and walked away with unified support for Tokyo's bid to join the UN Security Council.

The offer marks a big jump in Japanese aid in what some see as a growing battle of dollar diplomacy with China to hold sway over the region. China, which opposes Japan's UN aspirations, last month offered millions of dollars in aid to its Pacific allies.

Japanese Prime Minister Junichiro Koizumi announced the package yesterday at the end of a two-day meeting of Pacific leaders in Okinawa, winning dearly needed backing for Japan's beleaguered push for a Security Council seat.

"We in the Pacific have given our support to Japan," said Michael Somare, prime minister of Papua New Guinea and co-chair of the Pacific Island summit. "Japan has made a substantial contribution, not only in the region, but in international communities."

Friendships with the far-flung and impoverished Pacific states are an easy way for governments to win backing at international venues like the UN. The countries have tiny populations, meaning relatively small amounts of aid can go far, but they still wield one vote, the same as larger countries.

Together, the Pacific Island nations attending the Okinawa summit comprise only a fraction of the world's population but hold 14 UN votes, or about 7 percent of the total.

Environmentalists meanwhile accuse Japan of using Pacific aid to buy pro-whaling votes at the International Whaling Commission, a charge Japan denies.

"The Foreign Ministry has been very keen on using aid strategically," said political analyst Shigenori Okazaki. "Each of these countries has one vote."

Japan says its aid is about creating a more stable and prosperous region, not about jousting with China, a country that only recently got into the overseas aid business.

Koizumi said he welcomed China's development help to the region.

"I would not take that as a threat," Koizumi said. "If China and other countries wish to provide assistance and can provide assistance to various developing countries, fine. Please do so by all means."

Somare echoed the sentiment that Japan's aid had nothing to do with China.

"I don't think it should be seen as competing for influence in the region," he said. "I think Pacific Island people are capable of making their own decisions."

Just last month, Chinese Premier Wen Jiabao (溫家寶) jetted to the South Pacific and pledged 3 billion yuan (US\$374 million) in aid to countries such as Fiji, Vanuatu and Papua New Guinea. The aid targeted mining, agriculture, forestry, fisheries and aviation.

China has typically used the aid to win support for Beijing over Taiwan. But China, a permanent member of the UN Security Council, is also trying to block momentum for a seat for Tokyo, saying Japan has not properly atoned for its militaristic past.

Koizumi called Japan's aid package and the island nations' backing in the Security Council spat "an important milestone for Japan's foreign policy."

The aid will target education, economic development, health care, environmental protection and disaster mitigation projects, like early warning systems for tsunamis. It will also fund the training of thousands of civil servants.

The leaders also discussed recent unrest in the Solomon Islands and agreed to cooperate on fostering good governance in the region, while cracking down on international crime and terrorism.

Japan said it would divvy the aid among the countries according to needs and based upon the review of project proposals.

Japan has hosted the Pacific Islands four times since 1997, but Tokyo announced no new aid packages at the last summit in 2003.

7.8 Addressing Nanotechnology Risks

7.8.1 New Regulations Suggested to Address Nanotech-related Hazards

Nanotechnology Environmental, Health, And Safety Concerns Demand Action Today

Lux Research Inc. email newsletter <Lux_Research_Inc.@mail.vresp.com>

Lux Research partners with Intertox to offer a comprehensive nanotech EHS service

New York, NY – June 29, 2006 – The debate over the potential environmental, health, and safety (EHS) risks of nanomaterials has grown in intensity over the past year, as environmental groups call for restrictions and stage protests, and government agencies study the issue and consider regulations. With all this discussion, firms active in nanotech need a comprehensive plan to manage nanomaterial EHS risks today, according to a new report from Lux Research entitled "Taking Action on Nanotech Environmental, Health, and Safety Risks."

"There are three aspects of the nanotech EHS issue that firms need to confront," said Lux Research Analyst Michael W. Holman, Ph.D. "First and foremost, they need to manage real risks of their materials to ensure no actual harm comes to people or the environment. Furthermore, to successfully commercialize nanotech innovations, they must understand perceptual risk, which could undermine public or consumer acceptance of their nano-enabled products, regardless of real risks. And of course, they need to understand the emerging regulatory environment."

To assess the state of nanotech EHS issues and help firms develop strategies for coping with the challenges they present, Lux Research spoke with 17 experts from industry, academia, and non-governmental organizations, and 10 officials from agencies with regulatory authority over nano-enabled products. The research team also conducted in-depth discussions with five start-up CEOs and 10 representatives from leading corporations to understand how EHS issues are affecting nanotech commercialization today, and to identify their best practices. Lux Research found that:

Real risks of nanomaterials present challenges due to a lack of data, the complexity of the materials, measurement difficulties, and undeveloped hazard assessment frameworks. Just 316 peer-reviewed journal articles on real risks of engineered nanomaterials have been published, giving firms little scientific guidance to go on. To mitigate real risks, firms need a process plan to: 1) inventory all nanomaterials used across the company, 2) map those materials to applications and thus to potential exposures across the product life cycle, 3) characterize the risk of each application based on exposure and available knowledge about hazard, and 4) mitigate risk through exposure controls, additional testing, and product redesign.

On perceptual risks, the public's outlook on nanotech remains positive despite a lack of knowledge, but press coverage and agitation from NGOs mean that firms won't be able to dodge these questions much longer. Instead of remaining silent, companies need a communications strategy to share their safety studies, collaborate with trusted partners, and explain the benefits nanotech can bring.

EHS regulations will govern nanomaterials in a variety of applications. Exactly how the relevant laws will be applied isn't settled, but agencies are beginning to swing into action. To make sure their commercialization plans aren't hampered by these regulations, companies need to project how the U.S. Environmental Protection Agency (EPA) and other agencies will adapt existing regulations to accommodate nanomaterials.

The Lux Research analysis concludes that the unique EHS challenge nanotech presents will drive a new product development framework, just as complex manufacturing drove the "Total Quality" movement. "Companies can't afford to run extensive toxicity tests on each material their scientists consider using, but they also can't wait until just before product launch to

consider EHS concerns,” said Dr. Holman. “Instead, a staged approach to managing EHS issues should match risk-reducing actions to each step in the product development process.”

To help firms tackle nanotech EHS issues, Lux Research also announced that it has partnered with Intertox, a Seattle-based health science consulting and research firm, to offer a new service which will identify and mitigate potential EHS risks from nanomaterials. “Large, complex organizations that use nanomaterials in many areas struggle to stay on top of EHS issues in this rapidly-evolving field,” said Matthew M. Nordan, President of Lux Research. “By combining Lux Research’s deep understanding of nanotech commercialization with Intertox’s long experience in public health and risk assessment, we will help companies gain competitive advantage from nanotech with the confidence that their products and processes are safe, and that they won’t be exposed to liabilities down the road.”

The report provides in-depth analyses of available data and best practices on nanotech real risks, perceptual risks, and regulations, as well as guidance on how to structure product development and other processes in order to commercialize nanotech innovation safely and efficiently. The full report is available immediately to clients of Lux Research’s Nanotechnology Strategies advisory service. In addition, Dr. Holman will be discussing the report findings with Lux Research clients and selected guests on August 1 as a part of the Lux Research Interactive conference call series. For information on how to become a client, contact Lux Research Vice President Rob Burns at (646) 723-0708. For details on Lux Research Interactive, contact Daniel Gruneberg at (212) 644-9534 or dan.gruneberg@luxresearchinc.com.

About Lux Research:

Lux Research provides market intelligence and strategic advice on nanotechnology and the physical sciences. We help our clients make better decisions to profit from cutting-edge technologies by tapping into our analysts' unique expertise and unrivaled network. Our clients include top decision makers at large corporations, investment professionals at leading financial institutions, CEOs of the most innovative start-ups, and visionary public policy makers. To get connected and for more information, visit www.luxresearchinc.com. For Lux Executive Summit registration and additional event details, please visit www.luxexecutivesummit.com